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org.apache.commons.collections4.list

## Class LazyList<E>

* [java.lang.Object](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)
  + [org.apache.commons.collections4.collection.AbstractCollectionDecorator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)<E>
    - [org.apache.commons.collections4.list.AbstractListDecorator](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html)<E>
      * [org.apache.commons.collections4.list.AbstractSerializableListDecorator](http://docs.google.com/org/apache/commons/collections4/list/AbstractSerializableListDecorator.html)<E>
        + org.apache.commons.collections4.list.LazyList<E>
* All Implemented Interfaces: [Serializable](https://docs.oracle.com/javase/7/docs/api/java/io/Serializable.html?is-external=true), [Iterable](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)<E>, [Collection](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)<E>, [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E>  
    
  public class LazyList<E>  
  extends [AbstractSerializableListDecorator](http://docs.google.com/org/apache/commons/collections4/list/AbstractSerializableListDecorator.html)<E>  
  Decorates another List to create objects in the list on demand.  
  When the [get(int)](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#get-int-) method is called with an index greater than the size of the list, the list will automatically grow in size and return a new object from the specified factory or transformer. The gaps will be filled by null. If a get method call encounters a null, it will be replaced with a new object from the factory. Thus this list is unsuitable for storing null objects.  
  For instance:  
   Factory<Date> factory = new Factory<Date>() {  
   public Date create() {  
   return new Date();  
   }  
   }  
   List<Date> lazy = LazyList.decorate(new ArrayList<Date>(), factory);  
   Date date = lazy.get(3);  
     
  After the above code is executed, date will contain a new Date instance. Furthermore, that Date instance is the fourth element in the list. The first, second, and third element are all set to null.  
  This class differs from [GrowthList](http://docs.google.com/org/apache/commons/collections4/list/GrowthList.html) because here growth occurs on get, where GrowthList grows on set and add. However, they could easily be used together by decorating twice.  
  This class is Serializable from Commons Collections 3.1.Since: 3.0 See Also: [GrowthList](http://docs.google.com/org/apache/commons/collections4/list/GrowthList.html), [Serialized Form](http://docs.google.com/serialized-form.html#org.apache.commons.collections4.list.LazyList)

### Constructor SummaryConstructors

|  |  |
| --- | --- |
| * + Modifier | * + Constructor and Description |
| * + protected | * + [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#LazyList-java.util.List-org.apache.commons.collections4.Factory-)([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> list, [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html)<? extends [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> factory) Constructor that wraps (not copies). |
| * + protected | * + [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#LazyList-java.util.List-org.apache.commons.collections4.Transformer-)([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> list, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true),? extends [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> transformer) Constructor that wraps (not copies). |

### Method SummaryAll Methods Static Methods Instance Methods Concrete Methods

|  |  |
| --- | --- |
| * + Modifier and Type | * + Method and Description |
| * + [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html) | * + [get](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#get-int-)(int index) Decorate the get method to perform the lazy behaviour. |
| * + static <E> [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)<E> | * + [lazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#lazyList-java.util.List-org.apache.commons.collections4.Factory-)([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list, [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html)<? extends E> factory) Factory method to create a lazily instantiating list. |
| * + static <E> [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)<E> | * + [lazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#lazyList-java.util.List-org.apache.commons.collections4.Transformer-)([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true),? extends E> transformer) Transformer method to create a lazily instantiating list. |
| * + [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> | * + [subList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html#subList-int-int-)(int fromIndex, int toIndex) |

### Methods inherited from class org.apache.commons.collections4.list.[**AbstractListDecorator**](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html)[add](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#add-int-E-), [addAll](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#addAll-int-java.util.Collection-), [decorated](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#decorated--), [equals](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#equals-java.lang.Object-), [hashCode](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#hashCode--), [indexOf](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#indexOf-java.lang.Object-), [lastIndexOf](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#lastIndexOf-java.lang.Object-), [listIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#listIterator--), [listIterator](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#listIterator-int-), [remove](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#remove-int-), [set](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#set-int-E-)

### Methods inherited from class org.apache.commons.collections4.collection.[**AbstractCollectionDecorator**](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html)[add](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#add-E-), [addAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#addAll-java.util.Collection-), [clear](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#clear--), [contains](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#contains-java.lang.Object-), [containsAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#containsAll-java.util.Collection-), [isEmpty](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#isEmpty--), [iterator](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#iterator--), [remove](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#remove-java.lang.Object-), [removeAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeAll-java.util.Collection-), [removeIf](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#removeIf-java.util.function.Predicate-), [retainAll](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#retainAll-java.util.Collection-), [setCollection](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#setCollection-java.util.Collection-), [size](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#size--), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray--), [toArray](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toArray-T:A-), [toString](http://docs.google.com/org/apache/commons/collections4/collection/AbstractCollectionDecorator.html#toString--)

### Methods inherited from class java.lang.[**Object**](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true)[clone](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#clone--), [finalize](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#finalize--), [getClass](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#getClass--), [notify](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#notify--), [notifyAll](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#notifyAll--), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait--), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait-long-), [wait](https://docs.oracle.com/javase/7/docs/api/java/lang/Object.html?is-external=true#wait-long-int-)

### Methods inherited from interface java.util.[**List**](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)[add](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#add-E-), [addAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#addAll-java.util.Collection-), [clear](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#clear--), [contains](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#contains-java.lang.Object-), [containsAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#containsAll-java.util.Collection-), [isEmpty](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#isEmpty--), [iterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#iterator--), [remove](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#remove-java.lang.Object-), [removeAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#removeAll-java.util.Collection-), [replaceAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#replaceAll-java.util.function.UnaryOperator-), [retainAll](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#retainAll-java.util.Collection-), [size](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#size--), [sort](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#sort-java.util.Comparator-), [spliterator](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#spliterator--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#toArray--), [toArray](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#toArray-T:A-)

### Methods inherited from interface java.util.[**Collection**](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true)[parallelStream](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#parallelStream--), [removeIf](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#removeIf-java.util.function.Predicate-), [stream](https://docs.oracle.com/javase/7/docs/api/java/util/Collection.html?is-external=true#stream--)

### Methods inherited from interface java.lang.[**Iterable**](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true)[forEach](https://docs.oracle.com/javase/7/docs/api/java/lang/Iterable.html?is-external=true#forEach-java.util.function.Consumer-)

### Constructor Detail

#### LazyList protected LazyList([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> list, [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html)<? extends [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> factory) Constructor that wraps (not copies).Parameters: list - the list to decorate, must not be null factory - the factory to use for creation, must not be null Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if list or factory is null

#### LazyList protected LazyList([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> list, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true),? extends [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> transformer) Constructor that wraps (not copies).Parameters: list - the list to decorate, must not be null transformer - the transformer to use for creation, must not be null Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if list or transformer is null

### Method Detail

#### lazyList public static <E> [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)<E> lazyList([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list, [Factory](http://docs.google.com/org/apache/commons/collections4/Factory.html)<? extends E> factory) Factory method to create a lazily instantiating list.Type Parameters: E - the type of the elements in the list Parameters: list - the list to decorate, must not be null factory - the factory to use for creation, must not be null Returns: a new lazy list Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if list or factory is null Since: 4.0

#### lazyList public static <E> [LazyList](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)<E> lazyList([List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<E> list, [Transformer](http://docs.google.com/org/apache/commons/collections4/Transformer.html)<[Integer](https://docs.oracle.com/javase/7/docs/api/java/lang/Integer.html?is-external=true),? extends E> transformer) Transformer method to create a lazily instantiating list.Type Parameters: E - the type of the elements in the list Parameters: list - the list to decorate, must not be null transformer - the transformer to use for creation, must not be null Returns: a new lazy list Throws: [NullPointerException](https://docs.oracle.com/javase/7/docs/api/java/lang/NullPointerException.html?is-external=true) - if list or transformer is null Since: 4.4

#### get public [E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html) get(int index) Decorate the get method to perform the lazy behaviour. If the requested index is greater than the current size, the list will grow to the new size and a new object will be returned from the factory or transformer. Indexes in-between the old size and the requested size are left with a placeholder that is replaced with a factory or transformer object when requested.Specified by: [get](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#get-int-) in interface [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> Overrides: [get](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#get-int-) in class [AbstractListDecorator](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> Parameters: index - the index to retrieve Returns: the element at the given index

#### subList public [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> subList(int fromIndex, int toIndex)Specified by: [subList](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true#subList-int-int-) in interface [List](https://docs.oracle.com/javase/7/docs/api/java/util/List.html?is-external=true)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)> Overrides: [subList](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html#subList-int-int-) in class [AbstractListDecorator](http://docs.google.com/org/apache/commons/collections4/list/AbstractListDecorator.html)<[E](http://docs.google.com/org/apache/commons/collections4/list/LazyList.html)>

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